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What is claimed is:

    1.    A method for expanding print data to bit-map data in a network system composed of a plurality of computers, comprising the steps of:

    a) dividing the print data into a plurality of bands;

    b) transferring a sequentially selected one of the bands to an available one of at least two print data expanders each implemented in a computer;

    c) expanding a received band to bit-map band data in each of the at least two print data expanders; and

    d) combining the bit-map band data expanded by the at least two print data expanders to produce the bit-map data corresponding to the print data.

    2.    The method according to claim 1, wherein the step b) comprises the steps of:

    selecting one from the bands in sequence;

    selecting one of the at least two print data expanders by checking a process status of each of the at least two print data expanders; and

    transferring a selected band to a selected print data expander.

    3.    The method according to claim 1, wherein the step c)

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comprises the steps of:

expanding the received band to bit-map band data in each of the at least two print data expanders;

setting a process status of a print data expander to

5   unavailable while expanding the received band; and

resetting the process status to available when the received band has been expanded.


4.    The method according to claim 2, wherein the step c) comprises the steps of:

10    expanding the received band to bit-map band data in each of the at least two print data expanders;

setting the process status of a print data expander to unavailable while expanding the received band; and

resetting the process status to available when the

15   received band has been expanded.


5.    The method according to claim 1, wherein, in the step a), the print data is divided into the bands which are numbered from top of a page in sequence.


6.    The method according to claim 5, wherein the step d)

20   comprises the steps of:

receiving the bit-map band data from the at least two print data expanders;

determining whether the bit-map band data are

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received in original sequence of the bands;

rearranging the bit-map band data in the original
sequence when a sequence of the bit-map band data is not identical
to the original sequence; and

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reproducing the bit-map data corresponding to the
print data.

7.    A network system composed of a plurality of computers,
comprising:

a plurality of print data expanders each implemented
10   in a computer, for expanding print data to bit-map data;

a page divider for dividing the print data for each
page into a plurality of bands;

a band transfer controller for transferring a
sequentially selected one of the bands to an available one of at
15   least two print data expanders each implemented in a computer;

a combiner for combining bit-map band data expanded
by the at least two print data expanders to produce the bit-map
data corresponding to the print data.


8.    The network system according to claim 7, wherein the
20   band transfer controller selects one from the bands in sequence
and one of the at least two print data expanders by checking a
process status of each of the at least two print data expanders,
and then transfers a selected band to a selected print data
expander.

9.    The network system according to claim 7, wherein each of the at least two print data expanders expands a received band to bit-map band data, sets a process status of a print data expander to unavailable while expanding the received band, and resets the
5    process status to available when the received band has been expanded.

10.    The network system according to claim 8, wherein each of the at least two print data expanders expands a received band to bit-map band data, sets a process status of a print data expander
10    to unavailable while expanding the received band, and resets the process status to available when the received band has been expanded.

11.    The network system according to claim 7, wherein the page divider divides the print data for each page into the bands
15    which are numbered from top of a page in sequence.

12.    The network system according to claim 11, wherein the combiner receives the bit-map band data from the at least two print data expanders, determines whether the bit-map band data are received in original sequence of the bands, rearranges the bit-map
20    band data in the original sequence when a sequence of the bit-map band data is not identical to the original sequence, and reproducing the bit-map data corresponding to the print data.

13.     A print data control method for a network system composed of a print server computer and a plurality of client computers, comprising the steps of:

a) dividing print data into a plurality of sequential

5    bands;

b) distributing the sequential bands over the print server computer and at least one client computer to expand the sequential bands to bit-map band data in parallel among the print server computer and at least one client computer; and

10    c) combining the bit-map band data to produce the bit-map data corresponding to the print data.

14.     The print data control method according to claim 13, wherein the step b) comprises the steps of:

at a client computer,

15    selecting one from the sequential bands in sequence;

selecting one of the print server computer and the client computer by checking process statuses thereof;

transferring a selected band to a selected computer;

expanding a received band to bit-map band data; and

20    setting a client process status of its own to unavailable while expanding the received band and resetting the client process status to available when the received band has been expanded, and

at the print server computer,

expanding a received band to bit-map band data; and

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setting a server process status of its own to unavailable while expanding the received band and resetting the server process status to available when the received band has been expanded.

15. The print data control method according to claim 13,
5 wherein the step c) comprises the steps of:

determining whether the bit-map band data are received in original sequence of the bands;

rearranging the bit-map band data in the original sequence when a sequence of the bit-map band data is not identical
10 to the original sequence; and

reproducing the bit-map data corresponding to the print data.

16. A print data control method for a network system composed of a plurality of computers, comprising the steps of:
15 a) dividing print data into a plurality of sequential bands;

b) distributing the sequential bands over available computers to expand the sequential bands to bit-map band data in parallel among the available computers; and

20 c) combining the bit-map band data to produce the bit-map data corresponding to the print data.

17. The print data control method according to claim 16, wherein the step b) comprises the steps of:

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at a first computer,

selecting one from the sequential bands in sequence;

selecting one of the computers by checking process statuses
thereof;

5      transferring a selected band to a selected computer;

expanding a received band to bit-map band data; and

setting a first process status to unavailable while
expanding the received band and resetting the first process status
to available when the received band has been expanded, and

10      at each of the computers other than the first
computer,

expanding a received band to bit-map band data; and

setting a server process status of its own to unavailable
while expanding the received band and resetting the server process
15   status to available when the received band has been expanded.


18.   The print data control method according to claim 17,
wherein the first computer further combines the bit-map band data
to produce the bit-map data corresponding to the print data.


19.   The print data control method according to claim 16,
20   wherein the step c) comprises the steps of:

determining whether the bit-map band data are
received in original sequence of the bands;

rearranging the bit-map band data in the original
sequence when a sequence of the bit-map band data is not identical

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to the original sequence; and

reproducing the bit-map data corresponding to the

print data.

20.  A storage storing a print data control program for

5  use in a network system composed of a plurality of computers, the

print data control program comprising the steps of:

a) dividing the print data into a plurality of bands;

b) transferring a sequentially selected one of the

bands to an available one of at least two print data expanders

10  each implemented in a computer;

c) expanding a received band to bit-map band data in

each of the at least two print data expanders; and

d) combining the bit-map band data expanded by the

at least two print data expanders to produce the bit-map data

15  corresponding to the print data.